

A brief review of the Micropterigidae of Portugal, with description of a new species of *Micropterix* Hübner

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Abstract. The genus *Micropterix* in Portugal is reviewed; *Micropterix herminiella* sp. n. is described from northern Portugal and *M. granatensis* Heath, 1981 added to the Portuguese fauna. *M. ibericella* Caradja, 1920 and *M. aglaella* (Duponchel, 1838) are also accepted for Portugal.

Introduction

The family Micropterigidae is represented in the western palaearctic area only by the genus *Micropterix* Hübner [1825], with approximately 70 species. The geographical range of the genus and of individual species is very interesting. Although the Micropterigidae represent an ancient lineage that diverged from the rest of the Lepidoptera at a very early stage in the evolutionary history of the order, it would appear that the genus *Micropterix* is not of great antiquity. It is almost exclusively west palaearctic, with only two species reaching the Far East (Ponomarenko & Beljaev 2000), and none known from North America (Davis 1983). An ancient genus with so many species would be expected to be much more widespread, at least within the temperate climatic zone. The majority of species have limited areas of distribution, with the greatest diversity (25 species) in mainland Italy. This pattern suggests a relatively recent radiation rather than the result of the constriction of the distribution of ancient species, which would be expected to show significant disjunctions in at least some cases. Other areas with rich *Micropterix* faunas are north-west Africa, the Alps, the central Balkans and to a lesser extent, the Caucasus. The number of species in Greece, Turkey and the Iberian Peninsula (seven in mainland Spain, four in Portugal) is unexpectedly low, especially considering that these are areas which are often species-rich in other groups of Lepidoptera. A possible partial explanation is that *Micropterix* in these areas has not been well studied, perhaps because the moths do not generally come to light.

There is no readily available guide to the genus, apart from the Russian language papers of Kozlov¹ (1988, 1989, 1990a, b) which cover many of the species, as does the internet website of Kurz *et al.* (2001–2006). Identification can therefore be a protracted process, requiring the consultation of numerous papers. In this paper, a misidentification that dates back 126 years is resolved, with the description of a new species from Portugal, and the other species listed for Portugal are reconsidered.

¹ I can provide a translation of Kozlov's key to *Micropterix* upon request.

Abbreviations

BMNH	Natural History Museum, London, United Kingdom
CIBIO	Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade do Porto, Portugal
ZMUC	Zoological Museum, University of Copenhagen, Denmark

A brief review of *Micropterix* in Portugal

The *Micropterix* species that have been recorded from Portugal are considered below, in historical order.

Micropterix mansuetella Zeller, 1851, recorded from Seia, Serra da Estrela in Stainton (1881). This is discussed further below, where it is shown to be a misidentification of a previously unrecognised species, here described as *M. herminiella* sp. n.

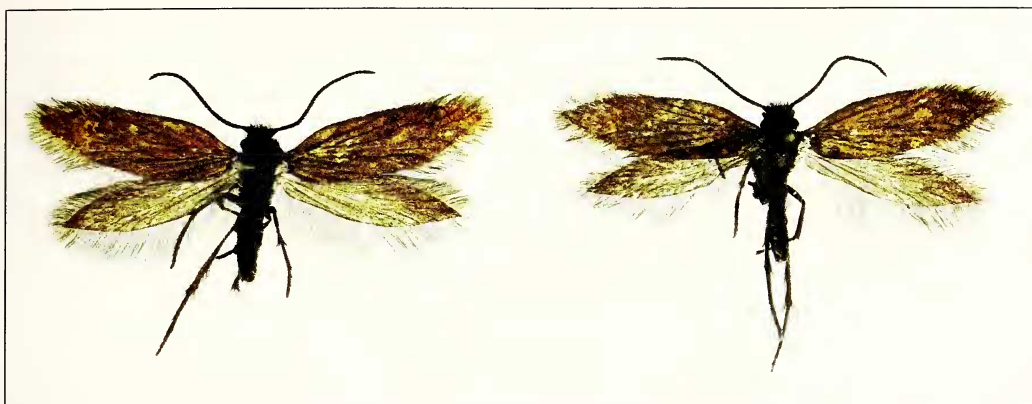
Micropterix aureatella (Scopoli, 1763), first recorded from Beira Baixa: Quinta do Barão by Mendes (1905), and later from Estremadura: Torres Vedras (Mendes 1910), before the description of *M. ibericella*, which is very similarly marked. There are no recent records of *aureatella*, so it must be considered to be a probable misidentification of *M. ibericella*. *M. aureatella* would not be expected in these hot, dry parts of the country, although it is possible that it could occur in the mountains of the north. It has not been recorded from Spain.

M. ibericella Caradja, 1920. *M. rebeli* Viette, 1949, was described from Portugal based on two specimens from Sintra in Naturhistorisches Museum, Wien (Viette 1949), and later synonymised with *M. ibericella* by Heath (1987). There are records from many parts of Portugal, and it is often common. This species is unusual in that it frequently comes to light, as well as being found by day.

M. aglaella (Duponchel, 1838) was collected by Monteiro from Douro Litoral: Singeverga in 1952, and identified by Amsel (1959). Unless the genitalia are examined, this species is not always separable from *M. ibericella*, which Amsel presumably considered, but there remains a slight possibility of a misidentification. There are two additional records from Algarve, dated 1962 and 1979 (Monteiro & Passos de Carvalho 1984). These would not have been seen by Amsel, and were probably not examined genitally. *M. ibericella* is common in Algarve and was not recorded there by these authors, so it is highly probable that these records refer to *M. ibericella*. It is hoped that examination of this species in the Monteiro collection will be possible.

M. sicanella Zeller, 1847 was listed for Portugal by Gómez Bustillo (1981), but no record is given, and it has not been possible to trace the origin of the listing, therefore it must be considered doubtful. It is not recorded from Spain.

M. granatensis Heath, 1981. A single female with the wing markings of *M. granatensis* was taken in Algarve: Picota, Serra de Monchique, 8 May 1995, leg. M.F.V. Corley. Subsequent search in the same area (north of the summit) failed to refind the species. The females in *Micropterix* do not give useful genitalia characters for identification, and in many cases the identification of females is not possible, but in the case of *M. granatensis* the markings are distinctive. Heath (1981) compares this species with *M. maschukella* Alpheraki, 1870, but this is a significantly larger insect. *M. granatensis*,



Figs 1–2. 1. *M. herminiella*, holotype, male. 2. *M. herminiella*, paratype, female.

which Heath reported from Granada and Málaga, can be added to the Portuguese fauna based on this specimen.

So currently, only three species of *Micropterix* are recorded from Portugal with certainty: *M. ibericella*, *M. granatensis* and *M. herminiella*. *M. aglaella* is almost certainly also present, but needs confirmation. These four species are keyed at the end of this paper.

In 1880, Rev. A. E. Eaton visited Portugal (Eaton 1880), travelling widely in the country and collecting insects of several orders. Eaton's particular interest was in aquatic insects, so his Lepidoptera specimens were sorted by Henry Stainton. Macrolepidoptera and Rhopalocera were sent to Staudinger for identification; Tortricidae, Pterophoridae and Pyralidae went to Ragonot and Stainton himself retained the remaining Microlepidoptera. The results were all published in 1881 (Ragonot 1881; Stainton 1881; Staudinger 1881). This is the earliest significant collection of Microlepidoptera from Portugal.

The Portuguese material collected by Eaton and named by Stainton is in the Natural History Museum, London. It consists of 61 specimens belonging to 44 species.

In this collection is a single specimen of *Micropterix*, collected near Seia [spelt Cea in Eaton (1880), and Stainton (1881)], Serra da Estrela. The head is black and the forewings are a uniform deep golden bronze colour. It was identified as *M. mansuetella* Zeller, 1844 by Stainton, since at the time, this was the only known black-headed *Micropterix*. However the specimen lacks the pinkish shining fasciae of *M. mansuetella*. Since first seeing this specimen I suspected that it was not this species. This suspicion is reinforced by the absence of other records of *M. mansuetella* from southern European countries. In Heath (1976), Bavaria was given as the southern limit of the distribution of *M. mansuetella*. Gómez Bustillo (1981) quotes a letter he received from John Heath in 1981, questioning the presence of *M. mansuetella* in Portugal, although he had failed to find the specimen in BMNH.

In 1986, Ole Karsholt took a single female of a black-headed *Micropterix* at Aldeias, Serra da Estrela. Aldeias is about 10 km north-east of Seia. He was aware of the record of *M. mansuetella* from Portugal, but his specimen, which is in ZMUC, did not match *M. mansuetella* in forewing pattern.

In 2004, I found about nine black-headed *Micropterix* on and around *Ranunculus* (Ranunculaceae) flowers growing by a shallow ditch at the edge of a track leading down to a small meadow by the River Mondego below the village of Trinta, in the eastern part of Serra da Estrela. Trinta is 21 km east of Aldeias. Dissection of males showed that this was not *M. mansuetella*, but an undescribed species, more closely related to *M. aruncella* (Scopoli, 1763). Subsequently, the species has been found in three more sites in northern Portugal (see list of material examined, below), in the provinces of Beira Litoral, Douro Litoral and Trás-os-Montes.

Micropterix herminiella sp. n.

(Figs 1–4)

Material. Holotype: ♂, 'P7217 | Portugal | Quinta da Volta | Trinta, Beira Alta | 750m [alt], 27.v.2004 | M.F.V. Corley', 'gen. prep. Corley 2750', in BMNH. – Paratypes: same data as holotype, 2♀ 'P7218', 'P7220' in BMNH; 1♂, 'P7219' 'gen. prep. Corley 2175', 1♀ 'P7221' in coll. Corley; 1♂ 'P7717 | 1 km W[est] Barragem | Montezinho, 1280m [alt] | Trás-os-Montes | 4.vi.2005 | M.F.V. Corley' 'gen. prep. Corley 2736', in coll. Corley; 1♀ 'P8018 | Valinhas | Monte Córdova | 16.v.2006 | Sónia Ferreira', in coll. Corley.

Additional material. **Portugal.** 1 of sex undetermined, Beira Alta: Seia, Serra da Estrela, 11.vi.1880, leg. A.E. Eaton, BMNH; 1♀, Beira Alta: Aldeias, Serra da Estrela, 1100 m alt., 12.vii.1986, O. Karsholt leg., ZMUC; 2♀, Beira Litoral: Casmilo, Serra de Janeanes, 16.iv.2005, leg. P. Pires, in coll. Pires.

Description. **Adult** (Figs 1, 2). Forewing length 3.4–3.8 mm (male); 3.8–4.3 mm (female). Head with black hair-like scales; antennae black, two-thirds length of forewing in male, slightly shorter in female. Thorax black, tegulae deep golden bronze. Forewings deep golden bronze, without markings or violet reflection near base, more red-tinged in female. Hindwings grey bronze, with reddish purple gloss mainly in costal half. Abdomen dark fuscous. Legs dark bronzy fuscous.

Male genitalia (Fig. 3). Dorsal process of tegumen (often incorrectly referred to as 'uncus') of medium length; anal lobe bifid with numerous short bristles; stout lobe in centre of tegumen between dorsal process and accessory clasper with median peduncle, lobe covered with long hairs (removed in fig. 1), peduncle with fine bristles; accessory clasper narrow, about three times as long as wide, more or less parallel-sided but with slight sigmoid curve, with dorsally directed subapical peduncle and ventrally directed subbasal peduncle, apex of clasper with about six large flattened spatulate setae, subapical peduncle with several broad-based narrowly pointed triangular setae, subbasal peduncle with three to four spatulate setae, like those at apex of clasper, and one similar but shorter and stouter seta; valva from elliptical base bearing group of fine setae, becoming very slender in middle, distally abruptly curved and expanded into short parallel-sided apical section, with group of stout obtuse setae on outer edge of curve, three or four longer stout setae near inner edge of apical section and small group of fine setae at rounded apex. Phallus simple, narrow, without cornutus, about as long as valva from base to curve.

Diagnosis. The great majority of *Micropterix* species have markings (usually fasciae, or fasciae and spots) on the forewings, and heads that have hair-scales of some shade of yellow. Comparison of *M. herminiella* is only necessary with species with black hair-scales on the head or with more or less unicolorous forewings. Black or dark

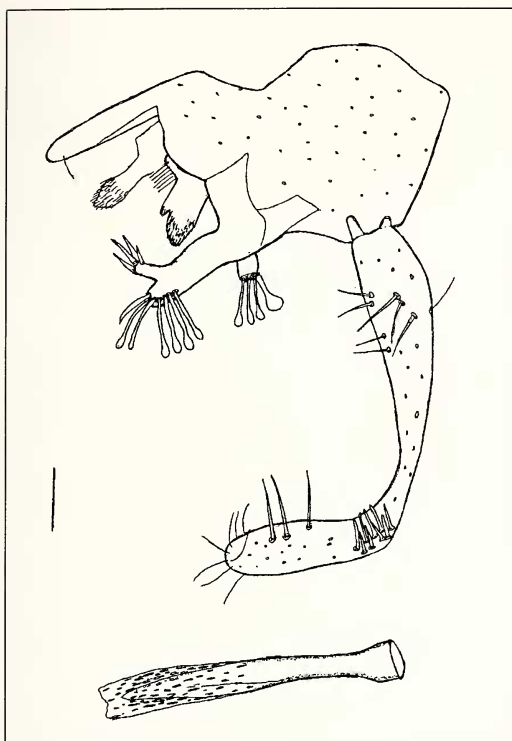


Fig. 3. Male genitalia of *M. herminiella*, lateral view. Scale bar 0.1 mm.

brown hair-scales on the head occur only in *M. mansuetella*, *M. sikhotealinensis* Ponomarenko & Beljaev, 2000 and *M. fenestrellensis* Heath & Kaltenbach, 1984, although this is not clear from the description of *M. fenestrellensis*. There are also black-headed forms of two normally yellow-headed species: *M. aruncella* (Scopoli, 1763) f. *atricapilla* Wocke, 1877 and a form of *M. myrtetella* Zeller, 1850 formerly treated as *M. idae* Rebel, 1902.

Since *M. aruncella* is dimorphic for head colour, the possibility that the Portuguese specimens might be a local race of a normally yellow-headed species must be considered. Several species have occasionally been found with more or less unicolorous forms, but these can be excluded, since there appears to be no variation in forewing coloration in *M. herminiella* apart from slight sexual dimorphism. *M. calthella*, *M. isobasella* and *M. garganoensis* have an area at the base of the forewing with violet reflection. There is no evidence

of this in *M. herminiella*. *M. sicanella* Zeller, 1847, *M. isobasella* Staudinger, 1871, *M. garganoensis* Heath, 1960, *M. paykullella* Fabricius, 1794 and the female of *M. aruncella* (Scopoli, 1763) regularly have more or less uniformly coloured forewings.

Comparison of the male genitalia of *M. herminiella* with all of the species considered above shows it to be very different from almost all of them, as it possesses a stout lobe in the centre of the tegumen between the dorsal process and accessory clasper. This character is present in a very small number of species, including *M. aureatella*, *M. sikhotealinensis* and *M. aglaella*. The first two of these show other similarities in the genitalia indicating that they are probably the closest relatives of *M. herminiella*, but differ particularly in the shape of the valva and the specialised setae on the accessory clasper, as well as in the forewing markings.

Distribution. Known from six sites in the northern third of Portugal (Fig. 4), *M. herminiella* can be expected to occur in Spain. The Serra de Montesinho site is less than two km from the Spanish border. Furthermore many Serra da Estrela specialities extend eastwards into Sierra de Gata or other ranges of the Sistema Central, and it is likely that *M. herminiella* will be found there also.

Life history. The early stages are unknown. Adults have only been found by day, either resting or flying. In three of the sites they were on and around *Ranunculus* flowers, from 16 April at relatively low altitude to 12 July at higher altitude. Altitudinal range is from 280m at Valinhas to 1300m alt. in Serra de Montesinho. Karsholt (*in litt.*) describes

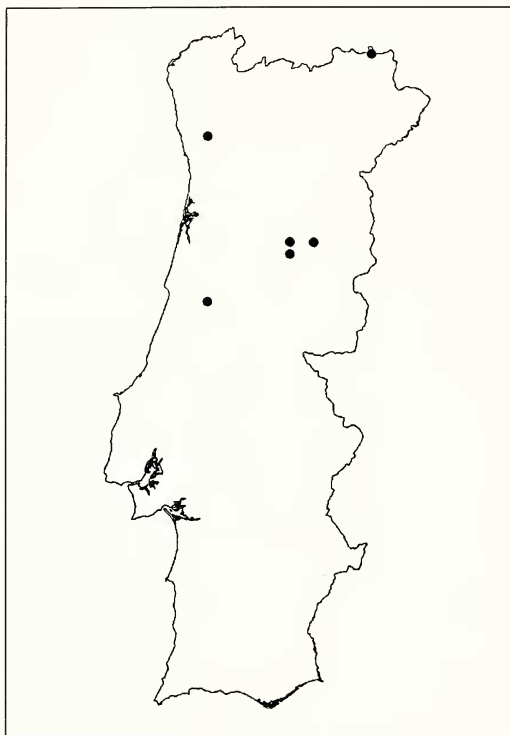


Fig. 4. Distribution of *M. herminiella* in Portugal.

the Aldeias site as north-facing and wet, with *Lotus pedunculatus* Cav. (Fabaceae). All the other localities were close to small streams, although other characters of the sites are very varied.

Etymology. The species takes its name from *Mons Herminius*, the Roman name for Serra da Estrela, where the first three records were made.

Discussion. Heath (1987) states that "...although some species form definite groups, no satisfactory serial arrangement has been arrived at using either genitalic structure or wing pattern and coloration." For this reason, any suggestion as to the correct place of *M. herminiella* within the genus, must be considered tentative. There are a few species that, like *M. herminiella*, have a stout lobe in the centre of the tegumen, visible between the posterior lobe and the accessory clasper, resulting in a reduction in size of the accessory clasper. According to Michael Kurz (pers. comm.), species exhibiting this lobe appear to be a

primitive group within the genus. *M. aureatella*, with a widespread European subspecies and a disjunct far eastern subspecies *M. a. shikotanica* Kozlov, 1988 in Sakhalin, Kuril Islands, Hokkaido and Honshu, has the widest distribution in the genus, although it is arguable that the genitalic differences between the two subspecies are sufficient to justify their treatment as two distinct species. *M. sikhotealensis* is the closest species in male genitalia morphology (and black-head) to *M. herminiella*. It is probable that this species pair and the two subspecies of *M. aureatella* are the descendants of two transpalaeartic Tertiary species that have diverged since their distribution range was broken by Quaternary glacial expansion and by desertification in Central Asia.

Key to Portuguese *Micropterix* based on external characters

- | | | |
|----|---|---|
| 1 | Head with black hair-scales | <i>M. herminiella</i> |
| 1' | Head with yellow hair-scales | 2 |
| 2 | Forewing with markings consisting of two transverse fasciae and a subcostal spot, or sometimes subcostal spot extended to form a fascia | <i>M. ibericella</i> and <i>M. aglaella</i> |
| 2' | Forewing with costal and dorsal markings, but without complete fasciae | <i>M. granatensis</i> |

Key to Portuguese *Micropterix*, based on male genitalia

- 1 Posterior process of tegumen long and slender, more than half as long as valva *M. granatensis*
- 1' Posterior process of tegumen shorter, less than half as long as valva 2
- 2 Tegumen with additional projection between posterior process and accessory clasper 3
- 2' Tegumen without additional projection between posterior process and accessory clasper *M. ibericella*
- 3 Valva narrowest in middle *M. aglaella*
- 3' Valva narrowest well beyond middle *M. herminiella*

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